DOCUMENT RESUME

ED 348 450 UD 028 821

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TITLE The Impact of an Achievement Formula on School Performance in an Urban Setting.
INSTITUTION Kent State Univ., Kent, OH. Center for Educational Leadership and Services.
PUB DATE Apr 92
NOTE 56p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, April 20-24, 1992).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Academic Achievement; *College School Cooperation; Data Collection; Educational Environment; Elementary School Teachers; Elementary Secondary Education; Instructional Leadership; Principals; *Program Effectiveness; Program Evaluation; School Districts; Secondary School Teachers; *Staff Development; Student Attitudes; *Student Evaluation; *Urban Schools
IDENTIFIERS *Kent State University OH; TRIVET Program

ABSTRACT

Since 1988, the Achievement Formula/TRIVET project has enabled researchers at Kent (Ohio) State University to collaborate with a large urban school district to assess, predict, monitor, and improve student achievement. The achievement portion of the project involves collecting and analyzing data on student performance and various contextual factors that may impact student and teacher behaviors (e.g., student attendance and attitude, building climate, and instructional leadership by the building principal). From these data, building and classroom profiles are developed to help the district identify targets for intervention. The TRIVET portion of the project is a staff development program for teachers and building administrators to collaboratively improve classroom instruction. Through workshops and follow-up classroom observations, participants analyze how teaching behaviors affect students. To date, the project has involved 16 buildings, almost 6,000 students, and 220 staff members. The most promising results among target populations are gains in student achievement, attitude, and attendance; improved perceptions among students and staff about building climate; greater confidence among teachers in the instructional leadership of the building principal; and dramatic improvements in teachers' willingness to change classroom practices and work collaboratively with fellow staff members to improve students' achievement and attitudes. Included are 46 references and 8 tables. (Author/RLC)

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The Impact of an Achievement Formula on School Performance in an Urban Setting

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The Impact of an Achievement Formula
on School Performance in an Urban Setting

ABSTRACT

Since 1988, the Achievement Formula/TRIVET project has enabled researchers at Kent State University to collaborate with a large urban school district to assess, predict, monitor, and improve (where necessary) student achievement. The Achievement portion of the project involves the collection and analysis of data on student performance as well as various contextual factors that may impact student performance as well as various contextual factors that may impact student and teacher behaviors such as student attendance, and attitude, building climate, and instructional leadership by the building principal. From these data, building and classroom profiles are developed to assist the district in the identification of specific targets for intervention. The TRIVET portion of the project is a staff development program for teachers and building administrators to collaboratively improve classroom instruction throughout the building. Through a series of workshops and follow-up classroom observations, participants analyze teaching behaviors in terms of their impact on students; the criteria used are those identified by the Process-Product and Teacher Effectiveness research as positively correlated with student achievement. Thusfar the project has involved 16 buildings, nearly 6,000 students, and 220 staff members. The most promising results among target populations include gains in student achievement, attitude, and attendance; improved perceptions among students and staff about building climate; greater confidence among teachers in the instructional leadership of the building principal; and dramatic improvements in the willingness of teachers to change classroom practices and work collaboratively with fellow staff members to improve the achievement and attitude of students throughout the building.

RESEARCH QUESTIONS AS PROJECT OBJECTIVES

The seminal question of this research has been whether the effectiveness of a district's instructional program could be increased through a self-study and staff development process that examines current levels of performance among staff as well as students. By improving classroom instruction from within rather than imposing an external model, and by using actual district data to address contextual factors such as attitude, climate, teacher expectations, and building-level leadership, would staff members confront the strengths and weaknesses of their own performance and make collaborative decisions about how to make improvements? The preparation of staff members to analyze and interpret achievement and various contextual data, to assume responsibility for the growth of fellow staff members through collaboration rather than evaluation, and to provide more appropriate classroom instruction to students have been major focal points in the project. Other more specific research questions have been as follows:

1. Would student achievement increase overall if a building staff's energies were directed toward helping specific students perform at levels more commensurate with their abilities? If there were less pressure to bring student test scores to an artificial level--beyond the capabilities of some students and well below those of others--would building staffs devote themselves to the more legitimate enterprise of reducing the discrepancy between students'

predicted and their actual levels of achievement? And if such discrepancies were reduced, would an overall gain in student achievement be reflected?

2. Could there be a shift from using achievement test scores as group status reports for comparison with other buildings and/or districts to employing them as one of several diagnostic tools to prescribe for the needs of individual students? Could classroom teachers be provided the skills necessary to translate various measures of student performance into intervention plans, not only for single classrooms but as grade-level, subject area, or building teams?

3. Could the status of various contextual factors that may impact student and staff performance be included in the intervention plans of each classroom and building? Could the traditional techniques of sampling such variables as student attendance, attitude, student and staff perceptions of school climate, the quality of classroom instruction, teacher expectations, and the effectiveness of instructional leadership provided by the building principal, be replaced by assessing each student and staff member involved to determine the impact of such factors on performance?

4. Could a cohort of teachers and administrators in each building master the competencies and attitudes necessary to appraise the effectiveness of classroom instruction and collaboratively prescribe action plans for growth and improvement? Would they be willing to augment the summative or checklist model with a formative

approach that examines teacher behaviors in terms of student impact and the collegial determination of how to make appropriate and workable improvements? Could this team direct its energies toward the continuous improvement of classroom instruction building-wide, reducing the discrepancy between students' predicted and actual levels of performance, and, thereby, increasing the overall level of achievement throughout the building?

5. Could the training program utilized to achieve the objectives above be institutionalized to the extent that a cadre of trainees would become part of the university team providing the instruction? In the spirit of the Professional Development Schools and the Holmes' group agenda, could these teacher trainers also serve as university associates to model effective instruction for fellow teachers as well as teachers-in-training?

6. Could the annual administrative performance review shift from a managerial and custodial focus to accountability for incremental improvements in student performance and attitude, student attendance, student and staff perceptions of school climate, the quality of classroom instruction, teacher expectations, and the confidence among teachers of the principal as an instructional leader?

7. How will project activity impact decision-making at the building level? What changes will occur among teachers and administrators as a result of the project?

8. What is the difference in impact between the two models of staff development: a few teachers in several buildings compared with half the staff in only three?

These research questions have provided the framework for the Achievement Formula project, giving shape and direction to its three years of inquiry.

THEORETICAL FRAMEWORK OR RESEARCH BASE

With his National Agenda of school reform, President Bush has challenged every school and community in the nation to reinvent American education for the year 2000 and beyond (Bush & Alexander, 1991). Even though school reform has become one of the most celebrated cliches of the twentieth century, very little seems to have been accomplished. In its 1991 survey of state-by-state school reforms, the Education Commission of the States reported that only 3% to 5% of the nation's schools were engaged in authentic restructuring efforts (Pipho, 1992). Bush and Alexander (1991) admit that despite an increase in education spending between 1981 and 1991 of 33%, the actual improvement in student performance nationwide has been negligible. Although the nation spent 200 billion dollars on education in 1991, "reform-watchers" in the Association for Supervision and Curriculum Development (O'Neill, 1991) cannot say with any assurance what American students are or should be learning.

Early Reform Efforts

In the initial reform reports, various commissions and individual crusaders documented precipitous declines in student achievement and remarkably weak performance expectations for students and staff alike. Since school effectiveness is synonymous with levels of student performance, the credibility of America's educational system had fallen into considerable disrepute. The analysis of weaknesses and the recommendations for restructuring the nation's schools promulgated in the 1980's still exist in the reinvention literature of the 1990's:

1. School districts must operate under the assumption that, irrespective of race, social class, or ability, each student can achieve at his optimum level, and that it is the responsibility of his school district to see that he does.

2. School districts must enact policies and procedures that reflect the board's authentic commitment to raising levels of student achievement; schools not only can, but must make a difference in the lives of their students.

3. School districts must require strong instructional leadership by their principals to coordinate and monitor various factors relative to student achievement and school success, and to empower teachers as partners in this process.

4. School districts must hold principals and teachers accountable for continuously monitoring student performance and providing feedback to students and parents.

5. The quality of classroom must be upgraded to accommodate the diverse learning needs of individual students; skills not yet or only partially mastered must be remediated through systematic and thoughtful intervention.

6. Teachers and administrators must be provided staff development specifically designed to appraise classroom instruction as per the teacher effectiveness and process-product research, and to collaboratively prescribe strategies for growth and improvement. These recommendations were among those set forth by researchers studying Effective Schools (Brookover, 1981; Brookover, Ferderbar, Gay, Middleton, Posner, & Roebuck, 1980; The California School Effectiveness Study, 1977; Edmonds, 1979; Edmonds & Comer in O'Neill & Shoemaker, 1989; Edmonds & Frederickson, 1978; Kean, 1979; Lezotte, 1982, 1983; The State of New York Study, 1974; Rutter, Maughan, Mortimore, Ouston, & Smith, 1979; Weber, 1971). Those schools found to be effective were characterized by (a) a safe and orderly school climate, (b) instructional leadership by the building principal, (c) positive student attitudes about themselves as learners, (d) increased attendance and involvement by students, (e) teacher expectations that students can and will achieve, (f) frequent monitoring of student achievement, (g) the authentic and naturalistic assessment of student performance, and (h) district commitment to student achievement.

Contrary to what might have been expected, the most effective schools were not necessarily wealthy. In the six-year study of

Louisiana School Effectiveness (Teddlie & Stringfield, 1990), the California High School effectiveness study (Murphy & Hallinger, 1985), and the re-examination of the Coleman, Hoffer, and Kilgore data (Chubb & Moe, 1990), the factors distinguishing effective from ineffective schools were independent of socio-economic status. Schools from the top achievement quartiles were distinct from those at the bottom in the following features:

1. The mission of high-performing schools was more academically ambitious and involved higher performance expectations, graduation requirements, and grading standards.

2. The leadership of the principal in high-performing schools was clearly focused on excellence in teaching, curriculum, personnel practices, and optimum levels of student achievement.

3. Teachers in high-performing schools, more than teachers in low-performing schools, had greater autonomy and responsibility, enjoyed the trust and respect of the principal, were more involved in decision-making, had a better record of attendance, and were convinced they could actually make a difference in student achievement.

In a review of prominent reform efforts, Levine (1991) identified several characteristics common to those schools that have documented having made a difference:

1. Substantial time for staff development was included, part of which occurred during the school day.

2. The primary focus of staff development was the improvement of instruction; the attention devoted to climate, school mission, and other contextual variables was framed in the context of instruction.

3. Faculties did not bog themselves down in attempts to train all staff members to make all needed changes in one year; the first year was devoted to awareness, data gathering and interpretation, curriculum planning, etc.; only small groups of staff were trained at any one time.

4. Reform goals were sharply focused to avoid over-extension.

5. Technical assistance was made available to participants.

6. Projects were data-driven and involved student achievement, student attitude, and attendance to guide participants in their intervention planning.

7. A judicious mixture of building autonomy and central office control enabled schools to meet their own needs without sacrificing the welfare of the district as a whole.

Why Has Reform Not Reformed?

O'Neill (1991) contends that the level of competence demonstrated by the majority of students receiving a high school diploma is scarcely better than it was a decade ago. Gibboney (1991) alleged that most of the reforms have been technological rather than cognitive and have tended to support standard practice rather than challenge it. Shanker (in Sparks, 1991) laments that only 3% to 6% of the 17-year olds taking the National Assessment of Educational Progress test

scored at the top levels. In Canada, France, Germany, Great Britain, Japan, and the Netherlands, 16% to 18% of the 17-year olds pass college entrance examinations that are more demanding than are the ACT or SAT tests. Hodgkinson (1991) suggests that America's best students may be able to perform on a par with those of other countries--albeit they are fewer in number. But the nation's bottom-level achievers perform far worse than do those in other industrialized democracies.

One of the problems with reform research is that it is difficult to ascertain precise cause-and-effect relationships between specific school variables and student achievement (Chubb & Moe, 1990; Glickman, 1991). Does school climate improve because of gains in student achievement, or does student performance improve in response to a more favorable school climate? Sizer (in Bowen, 1988) insists that most of the initial reform initiatives failed because they were promulgated in a "top-down" fashion from national or state-level mandates. In Sizer's judgement, the only reform efforts having any real chance of lasting success are those initiated from the "grass-roots" level in actual school settings with on-line personnel. A third reason that reforms have failed is that many districts have attempted to impose external or packaged plans that were never really integrated into the system and did not result in fundamental change (Gibboney, 1991; Levine, 1991). Researchers are convinced that reform efforts will be successful only to the extent that district staff members are involved in the identification and prioritization of problem areas and the

formulation of solutions. Moreover, reforms must be tailored to the specific needs of each building; even the most promising initiatives are not always appropriate district-wide, and attempts to "force-fit" the changes onto a staff usually destroy building-level ownership and commitment. District decision-makers must decentralize restructuring efforts if teachers are to make a genuine investment in reform.

Classroom Appraisal

Reformers have long insisted that school effectiveness can be dramatically increased through the improvement of classroom teaching and the resulting growth in student achievement. Several researchers have suggested that this enhancement of instruction is the direct result of effective classroom appraisal (Barth, 1990; Brophy, 1987; Chubb & Moe, 1990; Darling-Hammond, 1990; Glickman, 1991; Hallinger & McCary, 1991; Hoyle, 1990; Joyce, 1991; Medley, 1990; Sergiovanni, 1991; Sizer, 1991; Slavin, 1990; Stiggins, 1991). Although the onus for quality classroom performance falls squarely on the individual teacher, it is the responsibility of the building principal to identify and encourage effective teaching. Moreover, he or she must discover classrooms that are ineffective and provide the intervention necessary to make needed improvements (Crisci, March, & Peters, 1990a, 1990b). It is the responsibility of the superintendent of schools to hold principals accountable for the development of quality teaching. It is not surprising that many teacher evaluation systems have been ineffective in improving student outcomes. Evaluators are neither

trained nor experienced in distinguishing effective from ineffective instruction, and teachers believe that appraisals have little positive impact on what they do in classrooms (Andrews & Knight, 1987; Epstein, 1985; Hanny, 1987; Hoyle, 1990; McLaughlin, 1986; Turner, 1986). Barth (1990) laments that teacher evaluation has increased the distance between teachers and the principal and among teachers themselves. Darling-Hammond (1990) suggests that until recently, improving the quality of education was thought to be accomplished by altering the curriculum, using new management methods, or adopting an innovative instructional program. But variables like these can only affect pupil achievement if they result in substantial changes in the classroom activities of teachers and pupils (Brophy, 1987).

Frase and Downey (1990/1991) recommend the establishment of classroom performance standards and collecting evidence of teacher performance, documenting specific behaviors, attitudes, and outcomes. Among the data-gathering tools recommended are the Pre-Observation Conference, Scripting, the Post-Observation Conference, and a Performance-Improvement Plan. Teachers must be provided various types of resource assistance to improve their performance, and a specific timeline should be included for making the changes set forth. They must also be actively and thoughtfully involved in their own growth by learning about new research, increasing their understanding of pedagogy, and reflecting on the issues of change and renewal in

education. By devising long- and short-range goals, teachers can focus their energies in continuous self-improvement.

The Collegial Approach

As the interest in reform continues, one of the most widespread and promising developments in teacher appraisal is the collegial or collaborative approach. Several researchers report more substantive and enduring change in teacher behavior in cases where there was follow-up, regular feedback, and coaching by peers to reinforce and extend newly-acquired skills (Acheson & Gall, 1987; Brophy, 1987; Good & Brophy, 1986; Joyce & Showers, 1988; Rosenshine, 1986; Seaburn & Sudlow, 1987; Turner, 1986). The collaborative approach establishes a building-wide climate wherein adults and youngsters will function as a community of learners rather than a hierarchy of principals directing teachers directing students (Barth, 1990).

METHODS/TECHNIQUES/DATA SOURCES

The Achievement Formula/TRIVET process is a method for school districts to determine current levels of student and staff performance and then benchmark these levels against the standards set forth by reformers, now made even more emphatic by the Six National Goals for reinventing America's schools. District officials are then assisted in determining those areas in greatest need of reform or restructuring, as well as alternative methods for addressing those needs within the limits of available resources. The Achievement Formula utilizes existing district data for most of the initial

analysis and involves building staff members in the interpretation of results.

The Achievement Formula as a district self-study. The project assembles data on student performance to help districts determine whether current achievement levels are (a) consistent with district expectations, and (b) commensurate with student ability. Each student's aptitude, as measured on the Test of Cognitive Skills, and prior level of achievement expressed as the percent of objectives mastered on the local competency test for reading, are regressed to determine his or her anticipated level of performance. A comparison between the anticipated and actual levels of achievement identifies students who are functioning at, significantly above, or significantly below the achievement level expected. Those students who are 10 percentage points or more above or below their anticipated level are considered discrepant. The discrepant students who are "below" provide the basis for the classroom, grade-level, or building intervention. Since research has shown that academic performance is impacted by non-classroom as well as by classroom factors, data also are assembled on contextual variables positively correlated with student achievement. These data are also included in the various intervention plans.

Seven different data sources provide for this contextual analysis. First, student and staff perceptions of school climate are determined by the number of positive responses to questions on an adapted form of

the Connecticut School Effectiveness Survey At teacher request, responses for students are anonymous, but grade level and building are identified for reporting purposes. Secondly, data are collected from individual students about their attitudes and how they see themselves as learners. These data are obtained from a survey entitled The Student Self, developed by Anthony and Louise Soares. Each survey is labeled with the student's name and identification number, as well as building, homeroom, and grade level. The primary version of this survey consists of 11 questions, and scores range from a -2 to a +2 for each, yielding a total score that ranges from -22 to +22. The intermediate version of the survey consists of 20 questions, and total scores may range from -40 to +40. Thirdly, attendance data are obtained from the district records at the end of the school year. These data are reported by student identification number as days absent for the year. The fourth and fifth variables--the quality of classroom instruction and teacher expectations for students--are measured at the conclusion of the TRIVET training. Each teacher involved and his/her building administrator meet to discuss the level of teacher performance with regard to each criteria specified in the Teacher Effectiveness and Process-Product research, as well as the 15 TESA (Teacher Expectations for Student Achievement) behaviors. Each area of the training is rated as to level of competence by the principal/teacher partnership and becomes the basis for specifying job targets and growth areas A sixth variable is teacher perception of the

instructional leadership demonstrated by the building principal. These data are derived using a survey format with questions from The Connecticut School Effectiveness Survey, plus other questions shown by factor analysis to relate to instructional leadership. Teachers answer the surveys anonymously, and responses are coded by building only. The last data source is the level of district commitment to maximizing student achievement; it is measured through a survey of various populations within the district: (a) building-level administrators, (b) central office administrators, (c) school board members, (d) parents, (e) teachers, and (f) non-certificated employees. Respondents are asked to identify their own knowledge and level of involvement in projects and activities that demonstrate the district's authentic and not merely rhetorical commitment to high levels of student achievement. Each answer is then translated into a numerical value, and a total number of points is determined for each factor.

Data derived from the above variables are assembled into tables which are shared with each building staff to identify specific needs and devise appropriate plans for intervention. The tables can be run as class lists for individual homerooms or as grade-level lists for departmental consideration. Teachers identify specific contextual factors that "worked" with one or more "at" or "above" students that could be successfully applied to those who are "below" expected levels. Intervention plans can be derived for individual classroom or by grade-levels for teachers to work cooperatively. Each building

devises multi-faceted intervention plans, the precise character of which matches its own specific needs. Collectively, these building plans comprise the reform priorities of the district for the year.

Through the staff development activities that take place in TRIVET, teachers and principals collaboratively develop the behaviors and attitudes necessary to implement those intervention plans and, thereby, adopt the practice of continuous professional growth. At the end of the school year, each building staff evaluates its progress in accomplishing the objectives of its intervention plan, commends itself for successes, and targets un-met goals for next year's plan. Collectively, the district measures its progress not only in overall gains in student achievement but also in the contextual areas of attendance, attitude, climate, instructional leadership, quality of classroom instruction, and teacher expectations. Moreover, these indicators reflect additional evidence of the district's commitment to reform.

The TRIVET Program: Techniques of Responsive Intervention to Validate Effective Teaching. The staff development portion of the Achievement Formula, TRIVET is a year-long training program for teachers and administrators to improve the quality of classroom instruction and upgrade the achievement of students throughout a building. Teams of teachers and administrators work collaboratively to implement those classroom practices shown by the research to result in higher levels of student achievement and more positive attitudes

toward learning and school. TRIVET is a comprehensive program that deals with all aspects of instruction . The program draws on several decades of research from numerous theorists and practitioners and is updated annually to reflect the most recent developments in pedagogy and research. The basis of the TRIVET training is the analysis and improvement of classroom instruction and the establishment of a building team to work interdependently to that end. Through the observation and analysis of classroom instruction and the collaborative development of action plans for improvement, principals and fellow teachers work together not only to enhance the delivery of instruction but also to improve the various contextual factors that impact student achievement.

The TRIVET training consists of 72 clock-hours of workshop instruction and involves classroom observation spread over an entire academic year. This allows ample time for participants to practice observation and analysis techniques in the other classrooms and to actually implement the teaching techniques with their own students as well. All participants submit written accounts of their observations and assignments, and feedback is provided by the instructors. As the workshop progresses, skills and techniques become cumulative, and the incremental growth of each participant is carefully monitored throughout the year. At the end of the training year, each teacher participant meets with his or her building principal to collaboratively develop the teaching competency profile, mentioned

above. This profile indicates the teacher's level of proficiency with those teaching behaviors and attributes set forth in the Teacher Effectiveness and Process-Product research as positively correlated with student achievement. Teachers use this profile as the basis for their individual professional growth targets for the next school year, and each spring a new profile is developed to suggest the next year's targets.

The workshop content is presented in a manual of materials clustered into modules, each of which corresponds to a set of behaviors and attitudes set forth in the research. They are Planning, Classroom Management, Instructional Methods, Student Assessment, and Learning Climate. Each module includes the research findings and scholarship pertinent to that topic and specifies techniques, behaviors, and attitudes positively correlated with levels of student performance.

Four processes are utilized to examine the quality of instruction that is delivered in the classroom. They are (a) the Pre-observation Conference, (b) Scripting the lesson observed, (c) the Post-observation Conference, and (d) the collaborative Action Plan as a prescription for growth. Workshop participants and volunteer teachers conduct the Pre-conference in advance of the classroom observation; questions focus on year-long, unit, and daily planning to establish the context of the lesson to be observed. During the observation, participants Script-tape the lesson; they pay particular attention to

teacher behaviors and the accompanying student responses. The observer then analyzes the lesson by identifying strengths and improvable points, stated as the behaviors demonstrated by the teacher and their impact on the students. Participants then plan and deliver a Post-observation Conference, the culmination of which is an Action Plan, collaboratively developed by the participant and the teacher observed. The Action Plan specifies areas for growth, alternative strategies or behaviors to achieve the desired results, criteria for measuring success, a timeframe, and the resources necessary to accomplish the plan.

During the workshops, participants are involved in a variety of activities, many of which are designed to model the instructional and conferencing behaviors expected by the end of the training. Time is spent in discussion of the relevant research and specific decisions that must be made about the teaching activities featured in that respective module. A variety of small and large group activities are provided to reinforce networking among participants, as well as to solidify the group as a whole. Participants practice the four observation processes by using videotaped teaching segments from which they role-play various analysis and conferencing techniques. Continual emphasis is placed on modeling the desired behaviors and attitudes, and several opportunities are provided for team-building and collaboration. Between workshop sessions, participants use these techniques to perform classroom observations in collaboration with

other staff members in their building. In addition to utilizing the four processes, trainees implement and analyze the impact of several techniques in their own classrooms, including: (a) academic engaged time, (b) physical setting and arrangement of the classroom, (c) various grouping strategies (d) levels of student involvement during a lesson, (e) year-long curriculum mapping and unit planning, and (f) levels and types of questions.

Data used to determine the impact of the training come from several sources. Comparisons between participants' classroom appraisal skills prior to and following TRIVET training are determined through the use of a pre- to post-test measure. Participants are asked to view a videotaped teaching segment and demonstrate data collection, analysis, and prescription skills. They are provided a Pre-observation Conference and are asked to Script lesson,prepare a Post-observation Conference, and devise an Action Plan. A second measure is the improvement in the quality of the participants' written work submitted during the training. Each observation is reviewed by the trainers, and a rating sheet is used to reflect the participants' level of proficiency with each component of the four processes. This is displayed as a number of total points. Thirdly, participants are asked to evaluate the TRIVET training program from the perspective of its impact on what they do in their own classrooms as well as the impact on the instruction in the building. These data are collected through survey of those involved in the training. Finally, competency

profiles on the quality of classroom instruction and teacher expectations are collaboratively developed by building administrators and participating teachers. These profiles reflect the level of proficiency demonstrated on the criteria set forth in training, and become the job targets for the following year.

In order to determine the impact the project has made on student achievement and other contextual variables, data comparisons for the three years are examined in the areas of student achievement, student attitude, student attendance, teacher and student perceptions of school climate, teacher perceptions of building leadership, and changes in teaching behaviors in the classroom.

RESULTS

Guided by the research questions set forth at the beginning of this paper, the researchers at Kent State University have gathered and reported data in the following areas:

1. Did levels of achievement among project students in the experimental group improve during the course of the project when compared to an internal and external control group? The experimental group is defined as project students who were with a TRIVET trained teacher, the internal control group is defined as project students who were in a building where data were collected on the various contextual factors, but their teachers did not participate in the TRIVET training. Finally, the external control group are those students in the

remainder of the district who were not involved with the Achievement Formula project was possible.

2. Did the attitude of project students toward themselves as learners become more positive over the course of the project?

3. Did students in the experimental group demonstrate improved attendance over the course of the project thusfar?

4. Did the percent of positive responses from project teachers and students as to the 11 factors on the building climate survey became more positive over the course of the project?

5. Did the perceptions among project teachers about the building principal as instructional leaders become more positive after involvement in the project?

6. Did the TRIVET training have a positive impact on the skill of participants to observe and analyze a teaching segment?

7. Did teacher participants in the TRIVET training actually make modifications in their classroom behaviors in an effort to better meet the needs of students?

The Achievement Formula and TRIVET were field tested in three small school districts between 1986 and 1988 and then piloted in a large urban district beginning in 1988 and continuing to date. The results presented here are from a large urban district where over 6,000 students, 220 staff members from 16 buildings have been involved since 1988. There were 1,148 students involved in the project in 1991.

The following is a synopsis of the three-year results. Although 16 buildings have been involved in the project, the number of buildings reported in each table may vary according to the number of buildings responding in each data set.

Student Achievement. As measured by the California Achievement Test, the performance levels of project students in the experimental group have become more consistent with district expectations and more commensurate with their measured abilities. While overall improvement in student achievement is the ultimate objective, the Achievement Formula attempts to bring student achievement closer to measured ability levels. Table 1 shows that the percentage of project students in the experimental group achieving at or above their expected levels increased from 74% at the end of Year II to 80% at the end of Year III. The percentage of students in the experimental group achieving below their expected level decreased from 26% to 20% between Years II and III.

Insert Table 1 about here

The average Normal Curve Equivalent (NCE) for project students in the experimental group prior to their teachers' having received TRIVET training was 47. After being with a TRIVET-trained teacher for at least two years, the mean gain of these same students was four points.

A limitation was the lack of comparable data for the internal and external control groups.

In each grade level (Grades 2-7), project students in both experimental and internal control groups received higher NCE scores than did students in the external control group, or the rest of the district. Students in the experimental group who were with TRIVET trained teachers had a mean NCE of 49.00, which was slightly higher than the internal control group (students who were not with a TRIVET trained teacher) whose mean NCE was 47.50. It was found that TRIVET activities impacted the entire building even among teachers who were not participants in the training but involved with classroom observers and projects that were the result of the training. By comparison, the mean NCE of the external control group, or students who were in the remainder of the district, was 45.33.

Insert Table 2 about here

Another comparison between project students and students outside the project is in the distribution of scores across the four quartile bands. As shown in Table 3, 53% of the students in the experimental group scored in the top two quartiles, compared with 46% for those students in the internal control group and 35% for those students in the external control group. By contrast, the bottom two quartiles

show a distribution of 46% for the experimental group, 55% for the internal control group, and 65% for the external control group.

Insert Table 3 about here

One promising indicator is a reduction in the percentage of experimental group students scoring in the lowest quartile over the course of the three years. Prior to being involved in the project, 27% of the multi-year experimental group students scored in the lowest quartile; by the end of Year III, this figure was reduced to 19%. The percentage of students in Quartile I increased during the year they were not part of the experimental group.

Student attitude. As reflected on The Student Self by Soares and Soares, both the experimental and internal control groups of students became more positive about themselves as learners. The percentage of students reporting a very positive attitude increased from 45% to 55%; the percentage of students reporting a negative attitude dropped from 14% to 7% between Years II and III.

Student attendance. Although the number of days absent decreased among project students, the concerted effort already underway in the district to improve levels of student attendance may make it impossible to connect this positive change to project activity.

Building climate. As measured by The Connecticut School Effectiveness Survey, the perceptions of project students and teachers

about school climate improved by the end of the third year of the project. Student perceptions became more positive in 64% of the project buildings, and teacher perceptions improved in 70% of the buildings. Since the project teachers insisted that all responses be done anonymously, a distinction between experimental and internal control group responses is not possible.

Tables 4, 5, and 6 show the changes in the responses on the school climate survey from Year I to Year III. Table 4 shows the percent of buildings having more positive responses in Year III than it did in Year I for a particular factor. Those factors for which teacher perceptions improved significantly (70% or more) were clear school mission, time-on-task, high expectations, frequent monitoring of student progress, and equity. Students were significantly more positive about school-community relations, frequent monitoring of student progress, and safe orderly environment. A point for future study is the fact that a greater percentage of buildings showed improved student perceptions of school-community relations than teacher perceptions.

Insert Table 4 about here

Table 5 displays the data by building and factor for the teaching staff in that building. These data show the results of teacher responses for the 10 climate factors from Year I to Year III. For the

nine elementary buildings for which a full three years of data were available, one building showed improvement in teacher perceptions in four of the 10 climate factors, one showed improvement in the six of the 10 factors, five buildings reported improved perceptions about eight of the factors, and two building staffs reported more positive perceptions in all 10 areas assessed by the survey. Elementary teacher perceptions were more positive about time-on-task, clear school mission, high expectations, and equity. The areas of school-community relations and a safe orderly environment showed the fewest number of buildings with more positive responses from Year I to Year III. It is worthy to note that clear school mission, time-on-task, and high expectations were the focus of several building-level intervention plans that were developed by the building and project staff. The two areas of safe orderly environment and school-community relations have also been the focus of several building interventions, but activities undertaken in these areas have not been perceived by the teachers as making a significant impact in the school climate. These continue to be the focus of the current year's plans.

Insert Table 5 about here

Table 6 displays the same data for students. In the nine elementary schools for which the full three years of data were available, students in three buildings were more positive about all 11

factors, students in two buildings more positive about 9 and 10 of the variables. The variables that became more positive in at least 7 of the 9 buildings were time-on-task, high expectations, responsiveness to student needs, and school-community relations. The variable that became more positive in all nine buildings was frequent monitoring of student progress.

Insert Table 6 about here

Instructional Leadership by the building principal. Using an adaptation of the Instructional Leadership scale in The Connecticut School Effectiveness Survey, teachers in project buildings were asked their perceptions about the quality of instructional leadership demonstrated by their respective building principals. The results are reflected in four factors: decision making, curriculum and instruction, presence and visibility in the building, and interpersonal relations. In 11 of the 16 project buildings, the overall quality of instructional leadership was rated by teachers as stronger at the end of the last year than it had been in the first. In nine of the 16 buildings, the principals were rated as stronger in all four factors by the end of the last year than they had been the first year.

Insert Table 7 about here

Evidence of district commitment. A cross-section of teachers, administrators, school board members, and parents involved with project schools completed a survey identifying their perceptions about the district's commitment to improving student achievement. Respondents were asked if they had seen evidence of the district's authentic commitment to eight specific indicators that students are expected and encouraged to achieve to their optimum levels: (a) identifying prescribed levels of student achievement, (b) utilization of student aptitude or ability measures, (c) improved student attendance, (d) improved student attitude, (e) quality of classroom instruction, (f) increased teacher expectations for students, (g) a healthy school climate, and (h) effective instructional leadership by the building principal. At the end of Year I, only one indicator was perceived as being positive, but by the end of Year III, five indicators had received a positive response.

The quality of classroom instruction and teacher expectations. Among the most significant improvements resulting from the Achievement Formula/TRIVET project have been the quality of classroom instruction and the level of teacher expectations. The assumption in this project is that if teachers and principals can distinguish between effective and ineffective instruction and develop the competencies needed to consistently deliver effective instruction, student achievement will be enhanced. Support for this assumption can be found in the research

literature that demonstrates a positive correlation between effective teaching behaviors and increased student achievement. The TRIVET portion of the project provided a year-long staff development opportunity for building teams to establish these competencies in themselves as well as fellow teachers. Several measures were used to determine the impact of the TRIVET training, and the results are summarized below.

As shown in Table 8, the competency levels of participants in performing classroom observation, analysis, and prescription increased at the end of the training by 68%.

Insert Table 8 about here

Written assignments were evaluated by TRIVET instructors using a system of points. By the end of the training for each of the three project years, participants had earned at least 93% of the points possible.

At the conclusion of the training, each teacher participant met with his or her principal to collaboratively develop a teaching competency profile. By the end of Year II, TRIVET participants had earned at least 80% of the points possible, and by the end of Year III, trainees in all but one building had earned 90% of the points possible.

Additionally, teacher participants were asked to identify the status of each criteria before the TRIVET training, and how they had changed their delivery of instruction and expectations as a result of the training. While these data are self-report, they document the impact of the program as having positively changed teacher performance. Teachers report that they have continued to observe each other in the teaching process and are collaboratively working for improved instruction. Additionally, they report having developed curriculum maps and unit plans for the content they must present in class, the use of different grouping strategies, and incorporating various levels of Bloom's taxonomy. Finally, the utilization of previously trained TRIVET participants as members of the Kent State instructional team has also been a testament to the success of the project and the importance of continued involvement by additional teachers in the district.

EDUCATIONAL OR SCIENTIFIC IMPORTANCE OF THE STUDY

The potential significance of the Achievement Formula is heightened by national and state-level mandates to increase the accountability of public schools for improving student performance. With the threat of choice looming precariously amidst the National Goals for reinventing American Education, the very survival of public schools--especially urban districts--depends on their ability to graduate students who can compete academically with students from other nations of the world. Moreover, American districts must also

improve the various contextual factors that impact student performance,including school climate, classroom instruction, instructional leadership by the principal, and student attendance.

The Achievement Formula affords district decision makers a systems for assembling both achievement and contextual data on individual students, devising intervention plans for separate classrooms and entire buildings, and providing teachers and principals the training and opportunity needed to collaboratively improve classroom instruction. During the three years of project activity, building principals have availed themselves of TRIVET-trained teachers to provide assistance to other teachers in their professional growth. The Teacher Effectiveness and Process-Product classroom behaviors have become expectations for all teachers in the project buildings, and responsibility for the growth of peers has become the norm. At the university, staff members have engaged in action research, the results of which have impacted course offerings in the preparation of principals and the Professional Development Schools. Former TRIVET participants, the teacher trainers, have served as effective role models for fellow staff members as well as university personnel.

Although considerable data have been amassed over the three-year period to address the majority of research questions and project objectives, many issues have yet to be formally addressed. These include more elaborate statistical treatments of the data. For example, would correlations among specific contextual factors and

achievement offer more valid predictions of what truly impacts student performance? Are there positive correlations between or among specific teacher behaviors and school climate variables? Operationally, what specific decision-making practices that have changed as a result of the project?

With additional feedback and counsel of AERA colleagues, the staff hopes to strengthen the project, making it even more viable in the legitimate reform of American education.

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Table 1

Changes in Achievement Levels for Project Students in the Experimental Group

	Year II 1989–90 n = 861	Year III 1990–91 n = 1523
Percentage At or Above Expected Levels of Student Achievement	74	80
Percentage Below Expected Levels of Student Achievement	26	20

Table 2

1991 Reading Scores of the Experimental and Control Students Expressed as Mean NCE

	Grade Level						
	2	3	4	5	6	7	Average
Experimental Group – Students in project schools with TRIVET trained teachers n = 1,148	51	49	51	45	51	47	49.00
Internal Control Group – Students in project schools without TRIVET trained teachers n = 4,971	48	50	49	53	41	44	47.50
External Control Group – Students in other schools without TRIVET trained teachers n = 28,606	47	48	45	45	46	41	45.33

Note. Scores from California Achievement Test (CAT) reported as Normal Curve Equivalents (NCE).

Table 3

Percentages of Students Scoring in Each Quartile Band on the 1991 California Achievement Test

Quartile	Percentile Range	Experimental Group n = 1,148	Internal Control Group n = 4,971	External Control Group n = 28,606
4	(76 - 99)	13	17	10
3	(51 - 75)	40	29	25
2	(26 - 50)	29	37	38
1	(1 - 25)	18	18	27

Table 4

Percentages of Project Buildings Wherein Students and Teachers Reported Improved Climate From Year I to Year III

	Students	Teachers
Clear School Mission	60	87*
Opportunity To Learn/Time On Task	67	87*
High Expectations	60	87*
Responsiveness to Student Needs	67	N/A
Decision Making	47	60
Attitude/Attendance/Homework	N/A	N/A
Growth/Renewal	N/A	67
School–Community Relations	80*	47
Frequent Monitoring of Student Progress	87*	73*
Safe–Orderly Environment	73*	53
Consideration	47	67
Equity	53	73*

N = 15 buildings

*Denotes significant increases.

Table 5

Teacher Perceptions of Climate Factors From Year I to Year III

Building	1		2		3		4		5	
Year	I	III	I	III	I	III	I	III	I	III
Factors	n = 14	n = 8	n = 19	n = 12	n = 21	n = 12	n = 13	n = 21	n = 21	n = 21
Clear School Mission	81%	85%	66%	78%	65%	93%	71%	84%	57%	72%
Opportunity to Learn/ Time on Task	45%	57%	50%	53%	71%	86%	49%	71%	57%	66%
High Expectations	55%	58%	53%	58%	52%	73%	53%	73%	52%	64%
Responsiveness to Student Needs										
Decision Making	65%	64%	58%	65%	67%	82%	65%	71%	47%	51%
Attitude/Attendance/Homework		58%		45%		74%		73%		57%
Growth/Renewal	81%	68%	79%	72%	85%	90%	85%	88%	70%	73%
School-Community Relations	72%	66%	64%	56%	69%	70%	78%	80%	59%	63%
Frequent Monitoring of Student Progress	63%	53%	54%	58%	56%	73%	64%	78%	60%	59%
Safe Orderly Environment	73%	68%	46%	54%	75%	87%	66%	79%	59%	56%
Consideration	74%	71%	71%	77%	80%	88%	72%	85%	64%	77%
Equity	49%	77%	77%	78%	73%	86%	73%	85%	65%	70%

Table 5

Teacher Perceptions of Climate Factors From Year I to Year III

Building	6		7		8		9		10	
Year	I	III	I	III	I	III	I	III	I	III
Factors		n = 14	n = 15	n = 14	n = 12	n = 10	n = 9	n = 9	n = 12	n = 9
Clear School Mission	93%		89%	97%	87%	91%	84%	93%	75%	91%
Opportunity to Learn/ Time on Task	80%		73%	91%	65%	77%	59%	85%	57%	67%
High Expectations	70%		62%	80%	60%	71%	63%	79%	51%	79%
Responsiveness to Student Needs										
Decision Making	79%		80%	88%	69%	76%	85%	83%	71%	69%
Attitude/Attendance/Homework	63%			81%		73%		80%		74%
Growth/Renewal	84%		77%	93%	82%	90%	78%	84%	82%	93%
School-Community Relations	76%		82%	80%	77%	75%	84%	79%	64%	77%
Frequent Monitoring of Student Progress	69%		62%	84%	50%	68%	74%	72%	56%	63%
Safe Orderly Environment	77%		83%	81%	88%	72%	87%	87%	67%	72%
Consideration	87%		85%	94%	85%	95%	92%	94%	82%	76%
Equity	88%		81%	95%	87%	91%	86%	94%	81%	82%

Table 6

Student Perceptions of Climate Factors From Year I to Year III

Building	1		2		3		4		5	
Year	I	III	I	III	I	III	I	III	I	III
Factors	n = 84	n = 204	n = 140	n = 40	n =84	n = 125	n = 181	n = 292	n =82	n = 167
Clear School Mission	79%	74%	83%		72%	86%	63%	66%	47%	59%
Opportunity to Learn/ Time on Task	75%	68%	66%		63%	72%	57%	63%	48%	56%
High Expectations	62%	73%	73%		67%	84%	69%	69%	66%	60%
Responsiveness to Student Needs	76%	77%	71%		74%	86%	58%	69%	47%	61%
Decision Making	68%	58%	54%		63%	73%	47%	58%	34%	39%
Attitude/Attendance/Homework	69%	67%	68%		57%	78%	50%	55%	40%	47%
Growth/Renewal										
School-Community Relations	80%	71%	56%	50%	57%	70%	61%	68%	42%	51%
Frequent Monitoring of Student Progress	68%	73%	73%	63%	72%	83%	66%	75%	53%	62%
Safe Orderly Environment	70%	64%	52%	55%	68%	64%	47%	63%	35%	43%
Consideration	78%	78%	69%	54%	77%	79%	53%	62%	37%	36%
Equity	81%	64%	71%	64%	74%	77%	64%	67%	48%	48%

Table 6

Student Perceptions of Climate Factors From Year I to Year III

Building	6		7		8		9		10	
Year	I	III	I	III	I	III	I	III	I	III
Factors	n = 180	n = 239	n = 147	n = 280	n = 88	n = 193	n = 157	n = 278	n = 19	n = 79
Clear School Mission	66%	58%	73%	69%	67%	61%	61%	69%	51%	73%
Opportunity to Learn/ Time on Task	54%	55%	57%	61%	62%	57%	52%	61%	48%	68%
High Expectations	67%	62%	53%	65%	64%	65%	61%	67%	36%	69%
Responsiveness to Student Needs	67%	63%	67%	72%	78%	67%	63%	77%	56%	72%
Decision Making	47%	50%	60%	58%	64%	47%	62%	65%	48%	57%
Attitude/Attendance/Homework	52%	50%	59%	57%	50%	43%	48%	64%	55%	67%
Growth/Renewal										
School-Community Relations	49%	57%	63%	60%	48%	64%	49%	60%	43%	68%
Frequent Monitoring of Student Progress	55%	70%	65%	66%	63%	76%	59%	70%	62%	76%
Safe Orderly Environment	48%	62%	55%	54%	52%	58%	54%	62%	47%	72%
Consideration	49%	53%	61%	53%	63%	61%	52%	61%	48%	72%
Equity	66%	64%	61%	66%	67%	65%	61%	67%	52%	74%

Table 7

Percentage of Positive Responses from Teachers about Instructional Leadership of the Principal in Four Areas in First and Last Years of the Project

	Decision Making		Curriculum and Instruction		Presence and Visibility		Interpersonal Relations	
Building	First Year	Last Year	First Year	Last Year	First Year	Last Year	First Year	Last Year
1	60	74	57	75	80	88	77	89
2	61	86	56	74	79	90	86	89
3	52	90	51	88	74	94	71	90
4	77	82	81	77	88	92	77	84
5	27	51	27	39	43	57	51	59
6.	59	79	57	61	75	84	75	86
7	67	98	67	94	73	97	75	100
8	70	91	65	82	92	95	96	100
9	93	79	96	74	98	85	100	83
10	66	55	52	51	83	72	89	58
11	73	78	65	71	77	82	90	87
12	73	65	58	54	88	74	90	92
13	50	57	52	53	63	72	25	75
14	46	33	38	34	71	58	67	58
15	46	73	42	64	64	75	56	85
16	N/A	71	N/A	66	N/A	83	N/A	73

Table 8

Pre- to Post-training Growth in Observation, Analysis, and Prescription Skills

	Observation	Analysis	Prescription	Overall
Points Possible	100	42	10	152
Mean Points Pre-training	12.72	6.28	1.50	20.27
Mean Points Post-training	79.86	24.02	6.10	109.84
Mean Points Gain	67.14	17.74	4.60	89.57
Percent Gain	77%	50%	54%	68%